Claims

1. The salt of a sulfonic acid with clopidogrel at least part of which is present in crystalline form.

2. The salt of a sulfonic acid with clopidogrel which is preparable by precipitating the salt from a clopidogrel solution, the solvent comprising a hydrocarbon and/or an ether.

3. The salt according to claim 2 wherein the solvent comprises toluene, dioxane, methyl-tert-butyl ether and/or diethyl ether.

4. The salt according to claim 2 or 3 at least part of which is present in crystalline form.

5. The salt according to any of the previous claims wherein the sulfonic acid is selected from the group consisting of methane sulfonic acid, ethane sulfonic acid, benzene sulfonic acid, toluene sulfonic acid and naphthalene sulfonic acid.

6. The salt according to any of the previous claims which contains solvent molecules.

7. The salt according to claim 5 wherein the solvent is selected from toluene and dioxane.

8. The salt according to claim 7 which is clopidogrel besylate, is present in crystalline form and contains toluene, the 10 most intensive peaks of the X-ray powder spectrum of this salt having the following 2θ values

Relative intensity	2θ
99.11	10.78
100.00	12.08
96.77	16.09

62.57	16.66
84.58	20.22
93.53	21.50
66.00	22.56
78.33	22.91
81.82	23.45
56.15	24.92

9. The salt according to claim 8 which has the X-ray powder spectrum shown in Fig. 1.

10. The salt according to claim 7 which is clopidogrel besylate, is present in crystalline form and contains dioxane, the 10 most intensive peaks of the X-ray powder spectrum of this salt having the following 2θ values

Relative intensity	2θ
51.66	10.78
54.15	10.87
90.13	12.13
50.83	14.34
50.27	16.43
76.03	21.57
81.19	22.87
100.00	23.06
54.18	23.72
54.05	25.17

11. The salt according to claim 10 which has the X-ray powder spectrum shown in Fig. 2.

12. The salt according to claim 5 which is clopidogrel tosylate, the 10 most intensive peaks of the X-ray powder spectrum of this salt having the following 2θ values

Relative intensity	2θ
80.54	13.13
83.15	13.28

67.75	17.28
70.05	17.64
73.78	18.96
84.65	19.21
100.00	19.48
75.95	19.87
71.09	20.12
86.48	25.06

13. The salt according to claim 12 which has the X-ray powder spectrum shown in Fig. 3.

14. A method for preparing a salt according to any of the claims 1 to 13 wherein the salt is precipitated from a solution of the clopidogrel and the solvent comprising a hydrocarbon and/or an ether.

15. A method according to claim 14 wherein the solvent comprises toluene, dioxane, methyl-tert-butyl ether and/or diethyl ether.

16. A method for purifying clopidogrel wherein contaminated clopidogrel or a salt thereof, optionally after release of the clopidogrel base, is converted into the salt of a sulfonic acid with clopidogrel and, if desired, the clopidogrel base is then released from the isolated salt of the sulfonic acid and/or converted into another salt.

17. The use of a salt according to any of the claims 1 to 13 for preparing a pharmaceutical formulation.

18. A pharmaceutical formulation comprising a salt according to any of the claims 1 to 13.

19. Active ingredient particles comprising a solid adsorbent and clopidogrel or a pharmaceutically acceptable salt thereof adsorbed thereon.

20. Active ingredient particles according to claim 19 wherein the salt is selected from the group consisting of hydrogen sulfate, hydrochloride, mesylate, besylate and tosylate and napsylate.

21. Active ingredient particles according to claim 19 or 20 wherein the adsorbent is Lactopress.

22. The use of active ingredient particles according to claim 19, 20 or 21 for preparing a pharmaceutical formulation.

23. A pharmaceutical formulation comprising active ingredient particles according to claim 19, 20 or 21.

24. A method for preparing active ingredient particles as defined in claim 19, 20 or 21, comprising the recovery of the active ingredient particles from a solvent in which the adsorbent is insoluble or poorly soluble and the clopidogrel or the salt thereof is soluble.

25. A method according to claim 24 comprising suspending the adsorbent in the solvent, dissolving the clopidogrel or the salt thereof in the solvent and recovering the active ingredient particles.

26. A method according to claim 24 or 25 wherein the active ingredient particles are recovered by evaporation of the solvent.

27. A method according to any of the claims 24 to 26 wherein the clopidogrel and an acid are mixed with the suspension of the adsorbent.

28. A method according to claim 24 wherein the last stage of the synthesis of clopidogrel or a pharmaceutically acceptable salt thereof is carried out in the presence of the adsorbent.